

特点 Features

- 产品触点结构种类多，有1NC/1NO、2NC、2NC/1NO和3NC等多种接点形式。（同时还可提供慢动型MBB接点形式）
- 产品具有强制断开功能，当触点发生熔焊故障时可以强制断开（仅NC接点具有该功能）
- 强化顶部密封结构，以提高密封性能

- There are many kinds of contact structures, including 1NC/1NO, 2NC, 2NC/1NO and 3NC and other contact forms. (Also available in slow motion MBB contact form)
- The product has a forced disconnect function, which can be forced to disconnect when the contact fails to fuse (only the NC contact has this function).
- Strengthen the top sealing structure to improve the sealing performance

选型说明 Model Designation

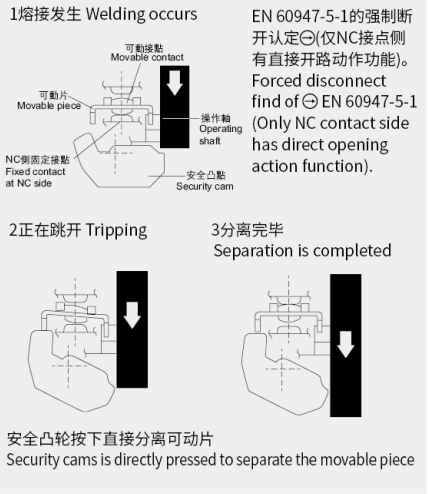
C4N - □ □ □ N
① ② ③ ④

序号 No	项目 Item	代号 Code	说明 Description	强制断开有 / 无 Forced disconnection Yes/No
①	产品系列 Product series	C4N	设计代号 Design code	
②	导管 / 连接器尺寸 Conduit/ connector size	1	Pg13.5(1 导管型 Conduit type)	
		2	G1/2(1 导管型 Conduit type)	
		3	Pg11(1 导管型 Conduit type)	
		4	M20(1 导管型 Conduit type)	
		9	M16(1 导管型 Conduit type)	
		5	Pg13.5(2 导管型 Conduit type)	
		0	Pg11(2 导管型 Conduit type)	
		6	G1/2(2 导管型 Conduit type)	
		7	M16(2 导管型 Conduit type)	
		8	M20(2 导管型 Conduit type)	
③	内藏开关 Hidden switch	1	1NC/1NO(速动型 Quick acting type)	
		3	1NC/1NO(慢动型 Slow motion type)	
		4	2NC(慢动型 Slow motion type)	
		7	1NC/1NO(慢动型 Slow motion type MBB)	
		9	2NO(慢动型 Slow motion type)	
④	头部及传动杆 Head and drive rod	11	顶部柱塞型 Top plunger type	仅 NC 端有强制断开 Only NC end has forced disconnection
		21	顶部金属柱塞型 Top metal plunger type	仅 NC 端有强制断开 Only NC end has forced disconnection
		22	顶部柱塞横滚珠 (金属滚珠) 型 Top plunger horizontal ball (metal ball) type	仅 NC 端有强制断开 Only NC end has forced disconnection

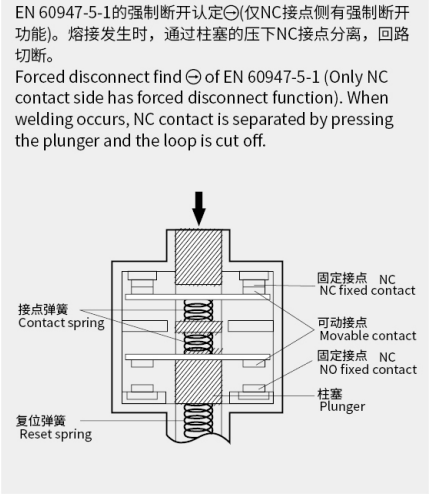
④	头部及传动杆 Head and drive rod	23	顶部柱塞竖滚珠（金属滚珠）型 Top plunger vertical ball (metal ball) type	仅 NC 端有强制断开 Only NC end has forced disconnection
		32	顶部柱塞横滚珠（金属头部）型 Top plunger horizontal ball (metal head) type	仅 NC 端有强制断开 Only NC end has forced disconnection
		33	顶部柱塞竖滚珠（金属头部）型 Top plunger vertical ball (metal head) type	仅 NC 端有强制断开 Only NC end has forced disconnection
		15	单侧悬臂滚珠型（水平） Single side cantilever ball type (horizontal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		16	单侧悬臂滚珠型（垂直） Single side cantilever ball type (vertical)	仅 NC 端有强制断开 Only NC end has forced disconnection
		04	滚珠摆杆型（金属摆杆，树脂滚珠） Ball swing rod type (metal swing rod, resin ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		04T	滚珠摆杆型（金属摆杆，树脂滚珠，转轴金属） Ball swing rod type (metal swing rod, resin ball, shaft metal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		05	滚珠摆杆型（金属摆杆，金属滚珠） Ball swing rod type (metal swing rod, metal ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		05T	滚珠摆杆型（金属摆杆，金属滚珠，转轴金属） Ball swing rod type (metal swing rod, metal ball, shaft metal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		07	可调棒式摆杆型 Adjustable rod swing rod type	仅 NC 端有强制断开 Only NC end has forced disconnection
		08	可调滚珠摆杆（金属摆杆，树脂滚珠） Adjustable ball swing rod (metal swing rod, resin ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		08T	可调滚珠摆杆（金属摆杆，树脂滚珠，转轴金属） Adjustable ball swing rod (metal swing rod, resin ball, shaft metal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		09	可调滚珠摆杆（金属摆杆，金属滚珠） Adjustable ball swing rod (metal swing rod, metal ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		09T	可调滚珠摆杆（金属摆杆，金属滚珠，转轴金属） Adjustable ball swing rod (metal swing rod, metal ball, shaft metal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		04H	滚珠摆杆型（金属摆杆，橡胶滚珠） Ball swing rod (metal swing rod, rubber ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		08H	可调滚珠摆杆（金属摆杆，橡胶滚珠） Adjustable ball swing rod (metal swing rod, rubber ball)	仅 NC 端有强制断开 Only NC end has forced disconnection
		08HT	可调滚珠摆杆（金属摆杆，橡胶滚珠，转轴金属） Adjustable ball swing rod (metal swing rod, rubber ball, shaft metal)	仅 NC 端有强制断开 Only NC end has forced disconnection
		66	塑料棒型 Plastic rod type	无 None
		67	盘簧型 Coil spring type	无 None
		68	金属杆盘簧型 Metal rod coil spring type	无 None
		69	触须型 Tentacle type	无 None

强制断开构造 Forced Disconnecting Mechansim

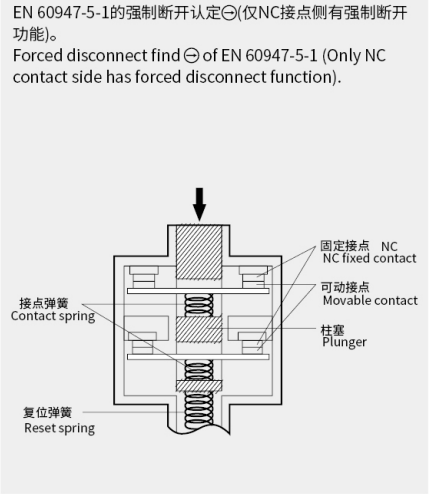
1NC/1NO接点(速动型)
1NC and 1NO contacts (snap-action)



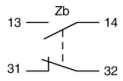
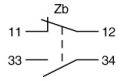
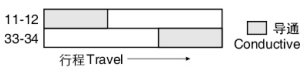
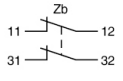
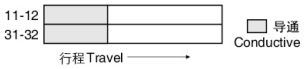
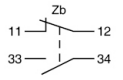
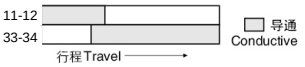
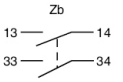
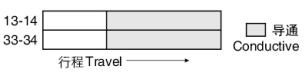
1NC/1NO接点(慢动型)
1NC and 1NO contacts (slow-action)



2NC接点(慢动型)
2NC contacts (slow-action)



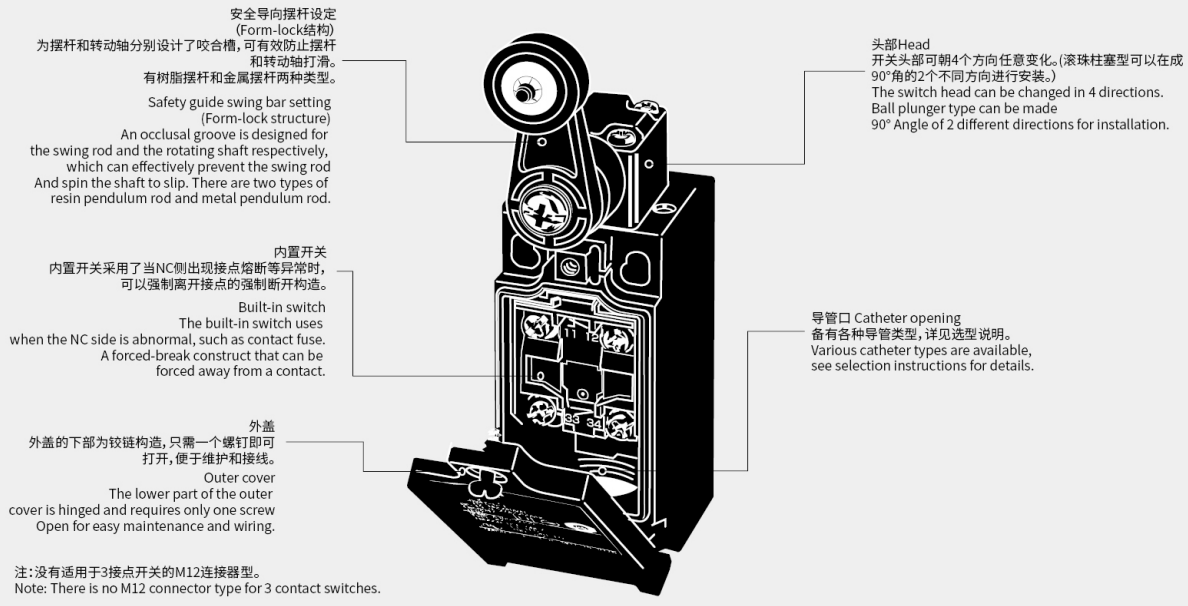
接点形式 Contact Form

型号 Model	接点 Contact	接点形式 Contact form	动作模式 Operation mode	说明 Explanation
C4N-□1□N	1NC/1NO(速动型) 1NC/1NO (Snap-action)			仅NC接点(31-32)具有强制断开功能(⊖)。 Only NC contact (31-32) has forced disconnect function (⊖) 接点(13-14) 和(31-32) 可作异极使用。 Contacts (13-14) and (31-32) can be used as heteropoles.
C4N-□3□N	1NC/1NO(慢动型) 1NC/1NO (Slow-action)			仅NC接点(11-12)具有强制断开功能(⊖)。 Only NC contact (11-12) has forced disconnect function (⊖) 接点(11-12) 和(33-34) 可作异极使用。 Contacts (11-12) and (33-34) can be used as heteropoles.
C4N-□4□N	2NC(慢动型) 2NC (Slow-action)			仅NC接点(11-12、31-32)具有强制断开功能(⊖)。 Both NC contacts (11-12, 31-32) have direct opening. 接点(11-12) 和(31-32) 可作异极使用。 Contacts (11-12) and (31-32) can be used as heteropoles.
C4N-□7□N	1NC/1NO MBB* (慢动型) 1NC/1NO MBB* (Slow-action)			仅NC接点(11-12)具有强制断开功能(⊖)。 Only NC contact (11-12) has forced disconnect function (⊖) 接点(11-12) 和(33-34) 可作异极使用。 Contacts (11-12) and (33-34) can be used as heteropoles.
C4N-□9□N	2NO(慢动型) 2NO (Slow-action)			接点(13-14)和(33-34) 可作异极使用。 Contacts (13-14) and (33-34) can be used as heteropoles.

注1： 端子编号依据EN 50013，接点形式依据EN 60947-5-1。 *MBB接点具有重叠结构，即在常闭接点(NC)开路前常开接点(NO)闭路的构造。
注2：2NC、 2NC/1NO、 3NC的接点闭路、开路动作同时性存在偏差，使用时请确认。 “

Note 1: The terminal number is in accordance with EN 50013 and the contact form is in accordance with EN 60947-5-1. * The MBB contact has an overlapping structure, that is, the normally open contact (NO) is closed before the normally closed contact (NC) is open.
Note 2:2NC, 2NC/1NO, 3NC contact closed-circuit, open-circuit operation of the simultaneous deviation, please confirm when using. “

结构 Structure



特性 Characteristics

保护等级 Protection level		IP67
寿命 Life	电气 Electrical	50万次以上(AC250V 3A、电阻负载) More than 500,000 times (AC250V 3A, resistive load)
操作速度 Operating speed		1mm-0.5m/s(C4N-4103型)
动作频率 Operating frequency		电气：30次/分 Electrical: 30 operations/min
接触电阻 Contact resistance		25mΩ 以下 (初期) 25mΩmax. (initial value)
绝缘电阻 Insulation resistance		100MΩ 以上 (在 500VDC 以下) 100MΩ min.(at 500VDC)
最小使用负载 Minimum working load		DC24V 10mA 以上 Min DC24V 10mA
额定绝缘电压(UI) Rated insulation voltage (Ui)		500V
防触电保护等级 Electric shock protection grade		Class II (双重绝缘) Class II (double insulated)
污染度(使用环境) Pollution degree (Using conditions)		污染度3(EN 60947-5-1) Pollution degree 3 (EN 60947-5-1)
耐电压 Withstand voltage (EN 60947-5-1)		同极端子间: 2.5kV Between homopolar terminals: 2.5kV
		异极端子间: 4kV Between heteropolar terminals: 4kV
		各端子和非充电金属部间: 6kV Between terminals and uncharged metal parts: 6kV
接点间隙 Contact gap		最小2×0.5mm速动型 最小2×2mm慢动型 Minimum 2×0.5mm snap-action, Minimum 2×2mm slow-action
振动 Vibration	误动作 Malfunction	10~55Hz 0.75mm单振幅 10~55Hz 0.75mm single amplitude
冲击 Impact	耐久 Duration	1,000m/s^2
	误动作 Malfunction	300m/s^2
约定自由空气发热电流Ith Convention free air heating current		10A
环境温度 Ambient temperature		使用时：-20~+70°C(没有结冰) Using：-20~+70°C(With no icing)
环境湿度 Ambient humidity		95%RH以下 Less than 95% RH

注1. 上述值为初始值。
注2. 一旦接点连接标准负载后，就不可用于连接更小容量的负载。否则可能导致接点表面粗糙，从而失去接触可靠性。
* 保护等级是根据(EN 60947-5-1) 规格的测试法得出的。使用前务必在实际使用的环境、条件下确认其密封性。 开关盒本体具有防尘、防油构造，但应尽可能保持头部在没有碎屑粉尘、油污、化学品的场所进行使用。否则可能导致过早磨损、损坏或故障。
*2. 耐久性的条件是使用环境温度 5°C~ 35°C、使用环境湿度 40% ~ 70% RH。其他详细条件请另行查询。
*3.使用环境温度为35°C以上时，禁止使用2回路以上的3A AC250V负载。
*4.这个值会因为开关频率、环境条件、可靠性等级等因素的影响而不同。请事先在实际负载上进行确认。

Note 1. The above values are initial values.
Note 2. Once the contact is connected to a standard load, it can not be used to connect a smaller load. If so, the contact may result in rough surface, thus losing contact reliability.
* The protection level is gotten based on test method of (EN 60947-5-1). Please make sure its sealing under actual environmental conditions before use. The switch box has dust and oil resistance structure, but it should be used in places without dust, oil and chemicals. Otherwise it may lead to premature wear, damage or malfunction.
*2. The durability is for ambient temperature of 5°C ~ 35°C and humidity of 40% to 70% RH. For additional details, please contact us.
Above 35°C, do not switch two or more 3A, 250VAC load circuits simultaneously.
*4.The values will vary with different switching frequency, environmental conditions, reliability level and other factors. Please confirm on the actual load in advance.

国际认证规格 International Certification Specifications

认证规格 Certification specifications	规格 Specifications	文件No. Document
CCC	GB/T 14048.5	请咨询昌得代表处 Please consult the CNTD Representative Office
TUV	EN 60947-5-1	
CE		

安全标准认证额定规格 Safety Standard Certification Rated Specifications

TUV (EN 60947-5-1), CCC (GB14048.5)

项目 Item	使用类型 Usage type	AC-15	DC-13
额定工作电流 Rated working current(Ie)		3A	0.3A
额定工作电压 Rated working voltage(Ue)		250V	220V

注： 请使用符合IEC60269的gI或gG型10A保险丝作为短路保护装置。开关内未配保险丝。
Note: Please use gI or gG 10A fuses that comply with IEC60269 as short-circuit protection devices. The switch is not equipped with a fuse.

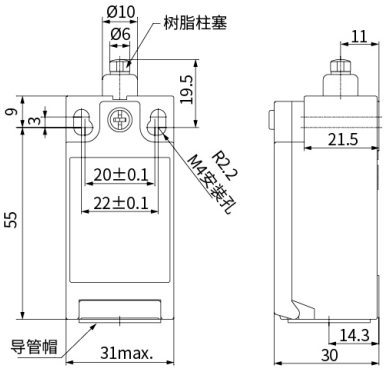
CSA(C22.2 NO.14)

类型与额定值 Type and Rating
240V/3A 阻性负载 Resistive load
0.27A/250V 阻性负载 Resistive load

外观和尺寸 Appearance and Dimension

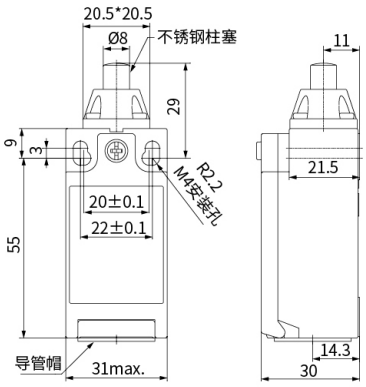
C4N-□□11N
顶部柱塞
Top plunger type





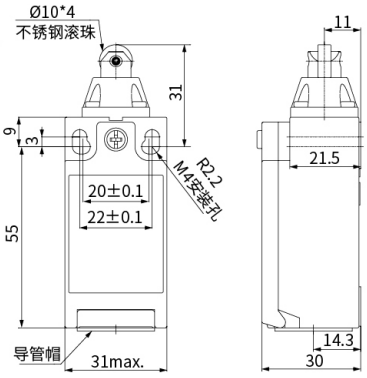
C4N-□□21N
顶部金属柱塞型
Top metal plunger type





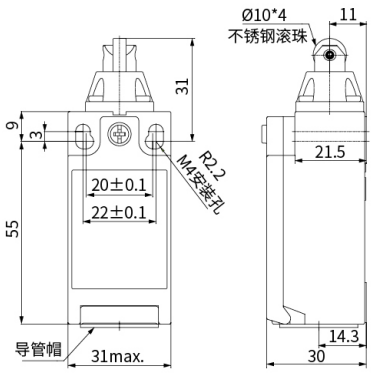
C4N-□□22N
顶部柱塞横滚珠（金属滚珠）型
Top plunger horizontal ball (metal ball) type





C4N-□□23N
顶部柱塞竖滚珠（金属滚珠）型
Top plunger vertical ball (metal ball) type





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□111N C4N-□411N	C4N-□121N C4N-□421N	C4N-□122N C4N-□422N	C4N-□123N C4N-□423N
动作力	OF(最大Max.)*1	10N	10N	10N	10N
	OF(最大Max.)	15N	15N	15N	15N
释放力	RF(最小Min.)	1.5N	1.5N	1.5N	1.5N
预行程	PT	1.7±0.3mm	1.7±0.3mm	1.7±0.3mm	1.7±0.3mm
运动差异	MD	0.8±0.2mm	0.8±0.2mm	0.8±0.2mm	0.8±0.2mm
过行程	OT(最大Max.)	4mm	4mm	4mm	4mm
总行程 *2	TT	(6mm)	(6mm)	(6mm)	(6mm)
动作位置	OP*4	17.5±0.5mm	27±0.5mm	29±0.5mm	29±0.5mm
强制断开行程*3	DOT(最小Min.)*1	3.5mm	3.5mm	3.5mm	3.5mm
	DOT(最小Min.)	2.5mm	2.5mm	2.5mm	2.5mm
强制断开力*3	DOF(最小Min.)	20N	20N	20N	20N

注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在竖直加力方向测得；
*1 仅支持速动型；
*2 为参考值；
*3 2NO 无强制脱离功能；
*4 NO 接通时。

Note: The open/closed action of 2NC, 2NO and 3NC contacts will be different at the same time.
The operating parameters of the switch are measured in the vertical afterforce direction.
*1 Only quick action type is supported;
*2 Reference value;
*3 2NO no forced disengagement function.;
*4 When NO is connected.

慢动型 (1NC/1NO)(2NC/1NO)

动作特性 Operating Characteristics		C4N-□311N C4N-□711N	C4N-□321N C4N-□721N	C4N-□322N C4N-□722N	C4N-□323N C4N-□723N
动作力	OF(最Max.)	15N	15N	15N	15N
释放力	RF(最小Min.)	1.5N	1.5N	1.5N	1.5N
预行程	PT1(NC断开)	1.7±0.3mm	1.7±0.3mm	1.7±0.3mm	1.7±0.3mm
	PT2(NO接通)	2.5±0.3mm	2.5±0.3mm	2.5±0.3mm	2.5±0.3mm
	PT1(NC断开)*1	2.2±0.3mm	2.2±0.3mm	2.2±0.3mm	2.2±0.3mm
	PT2(NO接通)*1	1±0.3mm	1±0.3mm	1±0.3mm	1±0.3mm
过行程	OT(最大Max.)	3.2mm	3.2mm	3.2mm	3.2mm
	OT(最大Max.)*1	3.5mm	3.5mm	3.5mm	3.5mm
总行程 *2	TT	(6mm)	(6mm)	(6mm)	(6mm)
动作位置	OP*3	16.7±0.5mm	26.2±0.5mm	28.2±0.5mm	28.2±0.5mm
	OP*4	17±0.5mm	26.5±0.5mm	28.5±0.5mm	28.5±0.5mm
强制断开行程	DOT(最小Min.)	2.5mm	2.5mm	2.5mm	2.5mm
	DOT(最小Min.)*1	3mm	3mm	3mm	3mm
强制断开动作力	DOF(最小Min.)	20N	20N	20N	20N

注：2NC/1NO 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在竖直加力方向测得；
*1 仅支持 MBB 型；
*2 为参考值；
*3 NO 接通时；
*4 NC 断开时。

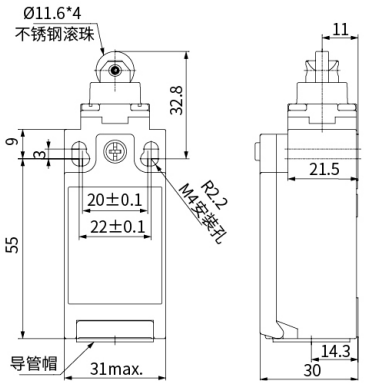
Note: Simultaneity of open/closed action of 2NC/1NO contact will be different.
The operating parameters of the switch are measured in the vertical afterforce direction.
*1 Only MBB type is supported;
*2 Is the reference value;
*3 When NO is connected;
*4 When NC is disconnected.

外观和尺寸 Appearance and Dimension

C4N-□□32N

顶部柱塞横滚珠
(金属头部) 型
Top plunger horizontal ball (metal head) type

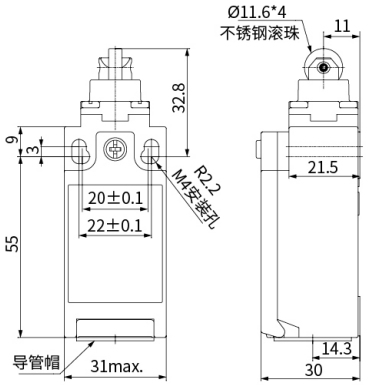




C4N-□□33N

顶部柱塞竖滚珠
(金属头部) 型
Top plunger vertical ball (metal head) type





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□132N C4N-□432N	C4N-□133N C4N-□433N
动作力	OF(最大Max.)*1	10N	10N
	OF(最大Max.)	15N	15N
释放力	RF(最小Min.)	1.5N	1.5N
预行程	PT	1.7±0.3mm	1.7±0.3mm
运动差异	MD	0.8±0.2mm	0.8±0.2mm
过行程	OT(最大Max.)	4mm	4mm
总行程 *2	TT	(6mm)	(6mm)
动作位置	OP*4	30.8±0.5mm	30.8±0.5mm
强制断开行程*3	DOT(最小Min.)*1	3.5mm	3.5mm
	DOT(最小Min.)	2.5mm	2.5mm
强制断开力*3	DOF(最小Min.)	20N	20N

注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在竖直加力方向测得；
*1 仅支持速动型；
*2 为参考值；
*3 2NO 无强制脱离功能；
*4 NO 接通时。

Note: The open/closed action of 2NC, 2NO and 3NC contacts will be different at the same time.
The operating parameters of the switch are measured in the vertical afterforce direction.
*1 Only quick action type is supported;
*2 Reference value;
*3 2NO no forced disengagement function.;
*4 When NO is connected.

慢动型 (1NC/1NO)(2NC/1NO)

动作特性 Operating Characteristics		C4N-□332N C4N-□732N	C4N-□333N C4N-□733N
动作力	OF(最大Max.)	15N	15N
释放力	RF(最小Min.)	1.5N	1.5N
预行程	PT1(NC断开)	1.7±0.3mm	1.7±0.3mm
	PT2(NO接通)	2.5±0.3mm	2.5±0.3mm
	PT1(NC断开)*1	2.2±0.3mm	2.2±0.3mm
	PT2(NO接通)*1	1±0.3mm	1±0.3mm
过行程	OT(最大Max.)	3.2mm	3.2mm
	OT(最大Max.)*1	3.5mm	3.5mm
总行程 *2	TT	(6mm)	(6mm)
动作位置	OP*3	30±0.5mm	30±0.5mm
	OP*4	30.3±0.5mm	30.3±0.5mm
强制断开行程	DOT(最小Min.)	2.5mm	2.5mm
	DOT(最小Min.)*1	3mm	3mm
强制断开动作力	DOF(最小Min.)	20N	20N

注：2NC/1NO 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在竖直加力方向测得；
*1 仅支持 MBB 型；
*2 为参考值；
*3 NO 接通时；
*4 NC 断开时。

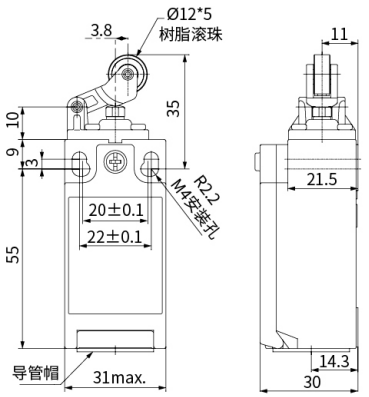
Note: Simultaneity of open/closed action of 2NC/1NO contact will be different.
The operating parameters of the switch are measured in the vertical afterforce direction.
*1 Only MBB type is supported;
*2 Is the reference value;
*3 When NO is connected;
*4 When NC is disconnected.

外观和尺寸 Appearance and Dimension

C4N-□□15N

单侧悬臂滚珠型 (水平)
Single side cantilever ball type (horizontal)

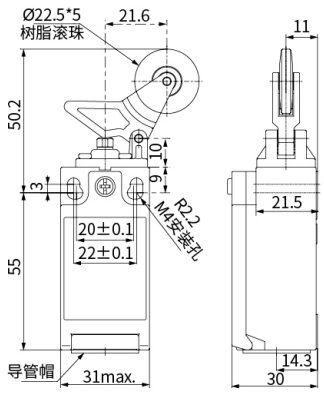




C4N-□□16N

单侧悬臂滚珠型 (垂直)
Single side cantilever ball type (vertical)





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□115N C4N-□415N *4	C4N-□116N C4N-□416N *5
动作力	OF(最大Max.)*1	8N	8N
	OF(最大Max.)	10N	10N
释放力	RF(最小Min.)	1.5N	1.5N
预行程	PT	2.2±0.5mm	3±0.5mm
运动差异	MD	1.3±0.3mm	1±0.3mm
过行程	OT(最大Max.)	5.3mm	6.5mm
总行程 *2	TT	(8mm)	(10mm)
动作位置	OP*6	32.3±0.5mm	51.5±0.5mm
强制断开行程*3	DOT(最小Min.)*1	5.5mm	6mm
	DOT(最小Min.)	3.2mm	4.5mm
强制断开力*3	DOF(最小Min.)	20N	20N

注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
*1 仅支持速动型；
*2 为参考值；
*3 2NO 无强制脱离功能；
*4 开关 15 动作参数在竖直加力方向测得；
*5 开关 16 动作参数在水平加力方向测得；
*6 NO 接通时。

Note: Simultaneity of open/closed circuit action of 2NC, 2NO and 3NC contacts will be different.
*1 Only quick action type is supported;
*2 Is the reference value
*3 2NO no forced disengagement function;
*4 Switch 15 action parameters are measured in the vertical afterforce direction;
*5 Switch 16 action parameters are measured in the horizontal afterforce direction;
*6 When NO is connected.

慢动型 (1NC/1NO)(2NC/1NO)

动作特性 Operating Characteristics		C4N-□315N C4N-□715N *3	C4N-□316N C4N-□716N *4
动作力	OF(最大Max.)	10N	10N
释放力	RF(最小Min.)	1.5N	1.5N
预行程	PT1(NC断开)	2.2±0.5mm	3±0.5mm
	PT2(NO接通)	3.2±0.5mm	4.2±0.5mm
	PT1(NC断开)*1	2.8±0.5mm	3.5±0.5mm
	PT2(NO接通)*1	1.2±0.5mm	1.7±0.5mm
过行程	OT(最大Max.)	4.3mm	5.5mm
	OT(最大Max.)*1	4.7mm	5.7mm
总行程 *2	TT	(8mm)	(10mm)
动作位置	OP*5	31.3±0.8mm	52±0.8mm
	OP*6	31.7±0.8mm	51.7±0.8mm
强制断开行程	DOT(最小Min.)	3.2mm	4.5mm
	DOT(最小Min.)*1	4mm	5.5mm
强制断开动作力	DOF(最小Min.)	20N	20N

注：2NC/1NO 接点的开路 / 闭路动作的同时性会有差异。
*1 仅支持 MBB 型；
*2 为参考值；
*3 开关 15 动作参数在竖直加力方向测得；
*4 开关 16 动作参数在水平加力方向测得；
*5 NO 接通时；
*6 NC 断开时。

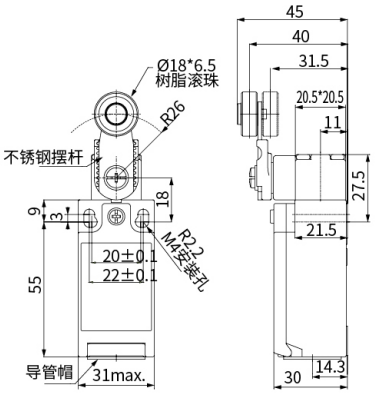
Note: There is a difference in the simultaneity of the open/closed action of the 2NC/1NO contact.
*1 Only MBB type is supported;
*2 Is the reference value;
*3 Switch 15 action parameters are measured in the vertical afterforce direction;
*4 Switch 16 action parameters are measured in the horizontal afterforce direction;
*5 When NO is connected;
*6 When NC is disconnected.

外观和尺寸 Appearance and Dimension

C4N-□□04N

滚珠摆杆型
(金属摆杆，树脂滚珠)
Ball swing rod type
(metal swing rod,
resin ball)

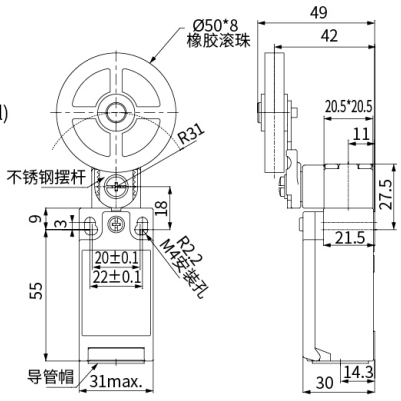




C4N-□□04HN

滚珠摆杆型
(金属摆杆，橡胶滚珠)
Ball swing rod
(metal swing rod, rubber ball)

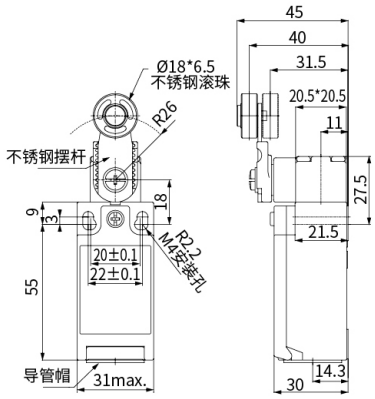




C4N-□□05N

滚珠摆杆型
(金属摆杆，金属滚珠)
Ball swing rod type
(metal swing rod,
metal ball)





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□104N C4N-□404N	C4N-□104HN C4N-□404HN	C4N-□105N C4N-□405N
动作力	OF(最大Max.)	8N		
释放力	RF(最小Min.)	0.5N		
预行程	PT	25°±5°		
运动差异*1	MD	12°±2°		
过行程	OT(最大Max.)	50°		
总行程 *2	TT	(80°)		
动作位置	OP	-		
强制断开行程*3	DOT(最小Min.)*1	50°		
	DOT(最小Min.)	35°		
强制断开力*3	DOF(最小Min.)	20N		

注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
*1 仅支持速动型；
*2 为参考值；
*3 2NO 无强制脱离功能。

Note: The open/closed action of 2NC, 2NO and 3NC contacts will be different at the same time.
*1 Only quick action type is supported;
*2 Reference value.
*3 2NO no forced disengagement function.

慢动型 (1NC/1NO)(2NC/1NO)

动作特性 Operating Characteristics		C4N-□304N C4N-□704N	C4N-□304HN C4N-□704HN	C4N-□305N C4N-□705N
动作力	OF(最大Max.)	8N		
释放力	RF(最小Min.)	0.5N		
预行程	PT1(NC断开)	25°±5°		
	PT2(NO接通)	40°±5°		
	PT1(NC断开)*1	35°±5°		
	PT2(NO接通)*1	15°±5°		
过行程	OT(最大Max.)	35°		
	OT(最大Max.)*1	40°		
总行程 *2	TT	(80°)		
动作位置	OP	-		
强制断开行程	DOT(最小Min.)	35°		
	DOT(最小Min.)*1	40°		
强制断开动作力	DOF(最小Min.)	20N		

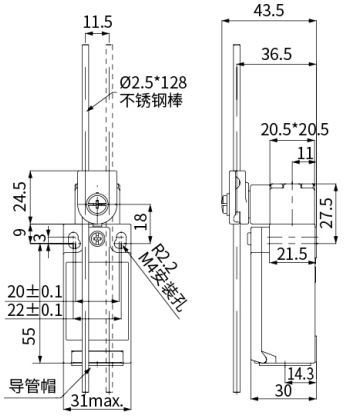
注：2NC/1NO 接点的开路 / 闭路动作的同时性会有差异。
*1 仅支持 MBB 型；
*2 为参考值；

Note: Simultaneity of open/closed action of 2NC/1NO contact will be different.
*1 Only MBB type is supported;
*2 is the reference value;

外观和尺寸 Appearance and Dimension

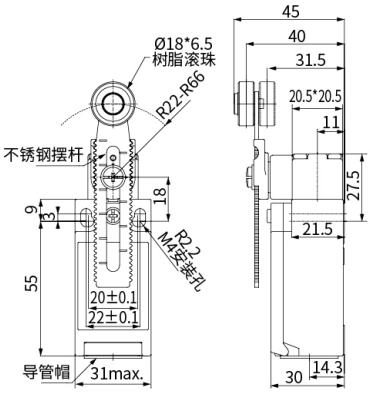
C4N-□□07N
可调棒式摆杆型
Adjustable rod swing rod type





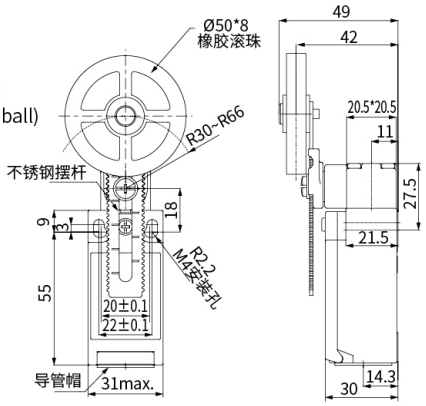
C4N-□□08N
可调滚珠摆杆
(金属摆杆，树脂滚珠)
Adjustable ball swing rod
(metal swing rod, resin ball)





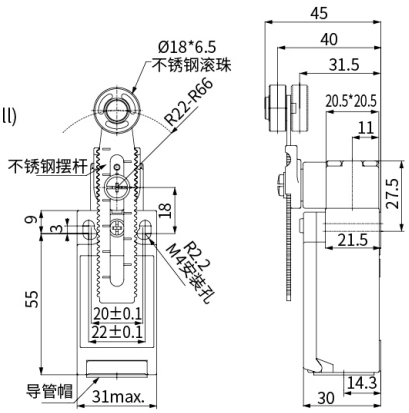
C4N-□□08HN
可调滚珠摆杆
(金属摆杆，橡胶滚珠)
Adjustable ball swing rod
(metal swing rod, rubber ball)





C4N-□□09N
可调滚珠摆杆
(金属摆杆，金属滚珠)
Adjustable ball swing rod
(metal swing rod, metal ball)





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□107N C4N-□407N *1	C4N-□108N C4N-□408N *1	C4N-□108HN C4N-□408HN *1	C4N-□109N C4N-□409N *1
动作力	OF(最大Max.)	8N			
释放力	RF(最小Min.)	0.5N			
预行程	PT	25°±5°			
运动差异*1	MD	12°±2°			
过行程	OT(最大Max.)	50°			
总行程 *2	TT	(80°)			
动作位置	OP	-			
强制断开行程*3	DOT(最小Min.)*1	50°			
	DOT(最小Min.)	35°			
强制断开力*3	DOF(最小Min.)	20N			

备注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在可调摆杆设定在 35mm 时测得；
*1 仅支持速动型；
*2 为参考值；
*3 2NO 无强制脱离功能。

Note: The open/closed action of 2NC, 2NO and 3NC contacts will be different at the same time.
The switch action parameter characteristics are measured when the adjustable pendulum rod is set at 35mm;
*1 Only quick action type is supported;
*2 is the reference value;
*3 2NO no forced disengagement function.

慢动型 (1NC/1NO)(2NC/1NO)

动作特性 Operating Characteristics		C4N-□307N C4N-□707N *1	C4N-□308N C4N-□708N *1	C4N-□308HN C4N-□708HN *1	C4N-□309N C4N-□709N *1
动作力	OF(最大Max.)	8N			
释放力	RF(最小Min.)	0.5N			
预行程	PT1(NC断开)	25°±5°			
	PT2(NO接通)	40°±5°			
	PT1(NC断开)*1	35°±5°			
	PT2(NO接通)*1	15°±5°			
过行程	OT(最大Max.)	35°			
	OT(最大Max.)*1	40°			
总行程 *2	TT	(80°)			
动作位置	OP	-			
强制断开行程	DOT(最小Min.)	35°			
	DOT(最小Min.)*1	40°			
强制断开动作力	DOF(最小Min.)	20N			

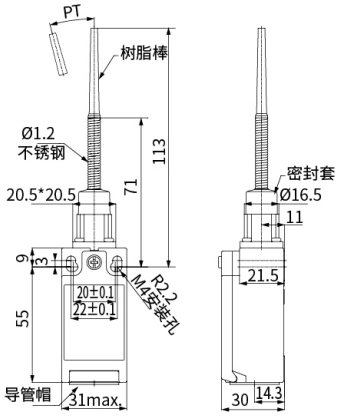
备注：2NC/1NO 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在可调摆杆设定在 35mm 时测得；
*1 仅支持 MBB 型；
*2 为参考值。

Note: Simultaneity of open/closed action of 2NC/1NO contact will be different.
The switch action parameter characteristics are measured when the adjustable pendulum rod is set at 35mm;
*1 Only MBB type is supported;
*2 is the reference value.

外观和尺寸 Appearance and Dimension

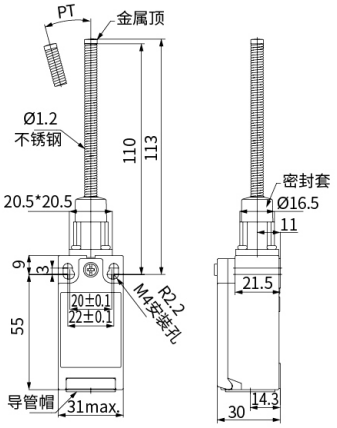
C4N-□□66N
塑料棒型
Plastic rod type





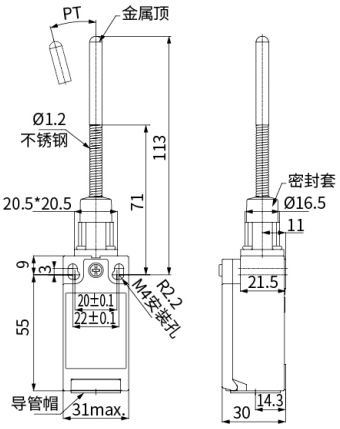
C4N-□□67N
盘簧型
Coil spring type





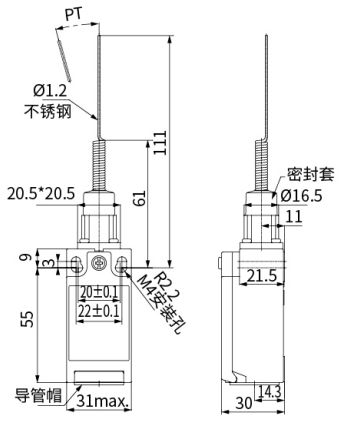
C4N-□□68N
金属杆盘簧型
Metal rod coil spring type





C4N-□□69N
触须型
Tentacle type





速动型 (1NC/1NO)(2NC)，慢动型 (2NC)(2NO)(3NC)

动作特性 Operating Characteristics		C4N-□166N C4N-□466N	C4N-□167N C4N-□467N	C4N-□168N C4N-□468N	C4N-□169N C4N-□469N
动作力	OF(最大Max.)	3N			
释放力	RF(最小Min.)	0.5N			
预行程	PT	10°±5°			
过行程	OT(最大Max.)	-			
总行程	TT	-			
动作位置	OP	-			

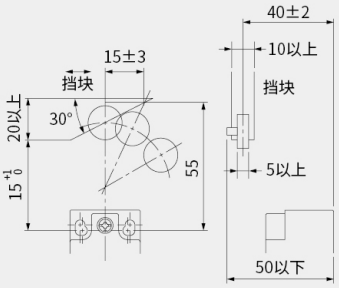
注：2NC、2NO 及 3NC 接点的开路 / 闭路动作的同时性会有差异。
开关动作参数特性在头弹簧 2/3 处时测得（头弹簧无弯曲）；

Note: The open/closed action of 2NC, 2NO and 3NC contacts will be different at the same time.
The switch action parameter characteristics are measured at 2/3 of the head spring (the head spring is not bent);

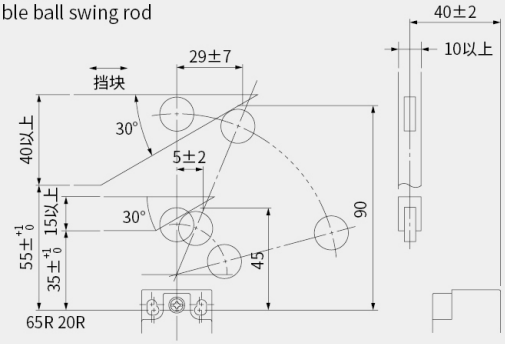
摆杆 Appearance and Dimension

挡块的角度、位置请参见下图（来源：EN50047）：
Please refer to the following figure for the Angle and position of the block (source: EN50047) :

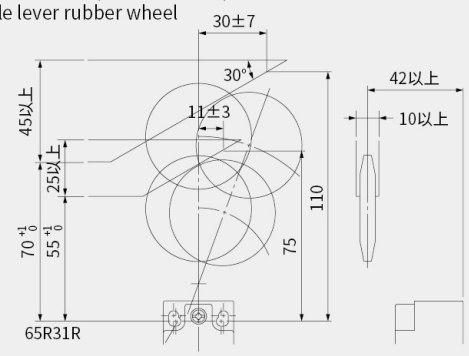
滚珠摆杆型
Ball swing rod type



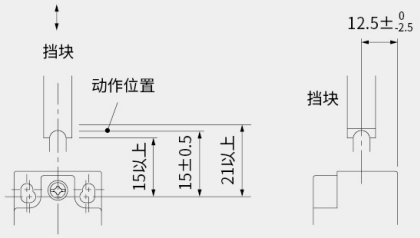
可调滚珠摆杆
Adjustable ball swing rod



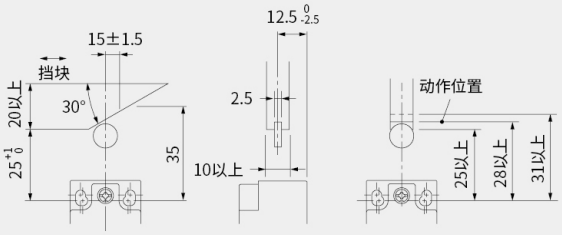
可调滚珠摆杆橡胶轮 (C4N- □□ 08H)
Adjustable lever rubber wheel



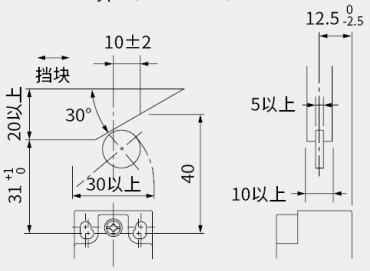
顶部柱塞型
Top plunger type



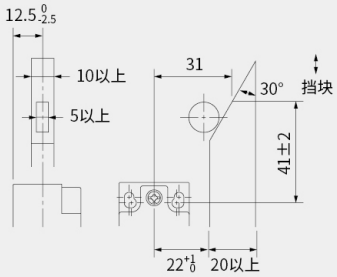
顶部柱塞横滚珠型
Top plunger horizontal ball type



单侧悬臂滚珠型（水平）
Single side cantilever ball type (horizontal)



单侧悬臂滚珠型（垂直）
Single side cantilever ball type (vertical)



安全注意事项 Safety Precautions

请避免在油渍或积水环境中使用本开关，因为这可能导致油或水渗入开关内部，损害其功能。虽然本开关具有 IP67 防护级别，但长时间置于水中仍可能导致渗水。
在接线工作完成并准备使用开关之前，确保外壳已经正确安装到位。切勿在外壳未封闭的状态下启动开关，以避免触电风险。
不建议同时控制两个或以上的标准负载电路（AC250V，3A），因为这样可能会削弱开关的绝缘性能。
确保传动杆已经推至完全锁定的位置，未锁定可能导致传动杆脱落或其他安全问题。
保持传动杆牢固锁定，并检查开关能按所选动作方式正常工作。

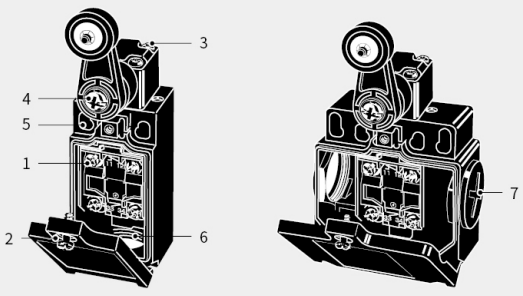
Avoid using this switch in environments with oil spills or standing water, as it could lead to oil or water infiltration inside the switch, compromising its functionality. Despite having an IP67 rating, prolonged submersion in water may still result in water ingress.
Before using the switch after completing the wiring, ensure the outer casing is correctly installed. Do not activate the switch when its cover is not properly closed to prevent the risk of electric shock.
It is not advisable to simultaneously control two or more standard load circuits (AC250V, 3A), as it might weaken the insulation properties of the switch.
Make sure the drive rod is fully locked into position, as failing to do so could result in detachment of the rod or other safety hazards.
Keep the actuator securely locked and verify correct switching action after installation.

安装方式 Installation Method

正确的紧固转矩
请按照正确转矩对螺钉进行紧固。螺钉松动可能导致开关早期故障

Correct tightening torque
Please tighten the screws according to the correct torque. Loose screws may cause early switch failure

编号 Number	类型 Types of	正确紧固转矩 Correct tightening torque
1	端子螺钉 Terminal screw	0.49-0.59N·m
2	外盖安装螺钉 Outer cover installation screws	0.5~0.6N·m
3	头部安装螺钉 Head mounting screws	0.35~0.45N·m
4	摆杆安装螺钉 Swing rod installation screw	1.2~1.3N·m
5	本体安装螺钉 Body mounting screws	0.5~0.7N·m
6	连接器，M12 转接器 Connector, M12 adapter	1.8~2.2N·m
7	螺钉帽 Screw cap	1.3~1.7N·m



适用导线 Applicable Conductor

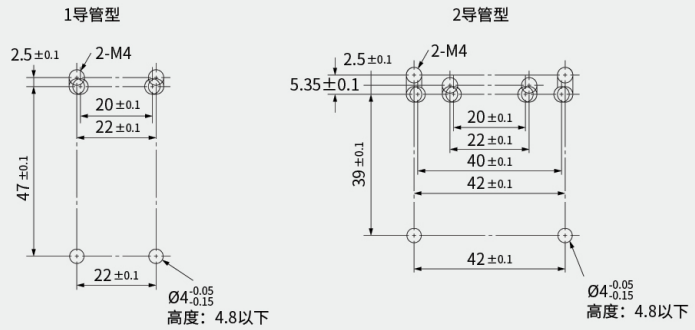
电线名称 Wire name	推荐使用电线 Wire is recommended		
	线芯数 Number of cores	导体 Conductor	成品外径 Nom OD
塑料橡皮绝缘软电线 Plastic rubber insulated flexible wire	2芯 2-core 3芯 3-core 4芯 4-core	0.5~0.75mm²	圆形 Circular φ6~φ9
600V 塑料绝缘 塑料外皮电缆(VVF) 600V plastic insulation Plastic sheathed cable	2芯 2-core	φ1/φ1.2/φ1.6	

若电线含有硅油，可能会导致接触不良。为确保电气设备的正常运行，请避免使用含硅油的产品。
The presence of silicone oil in wire may result in inadequate contact. To ensure the proper functioning of electrical equipment, please refrain from using products containing silicone oil.

开关安装 Switch installation

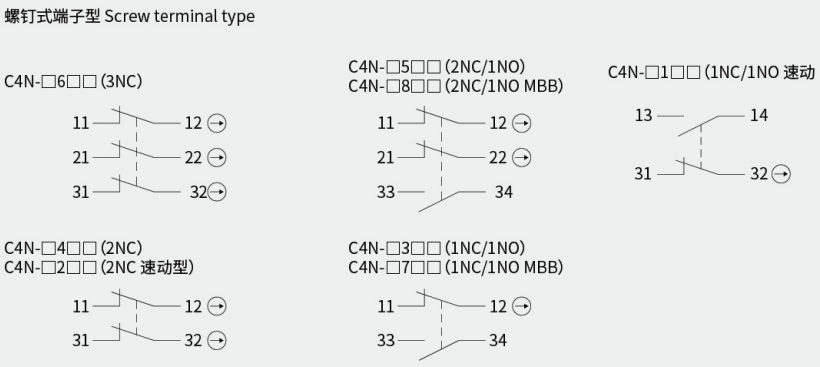
当安装开关时，请使用 M4 尺寸的螺钉和弹簧垫圈，并按照推荐的扭矩值紧固螺钉。为了确保安全，建议使用难以松动的螺钉或采取其他等效的安全措施，以保证开关的稳固和可靠。此外，您也可以使用两个高度不超过 4.8mm、直径为 4mm 的螺栓，插入开关底部的孔中，采用四点固定方式来实现更加稳固的安装。

When mounting the switch, use M4 screws with spring washers and tighten them to the recommended torque. For safety, it's advisable to use screws that are not easily loosened or implement equivalent safety measures to ensure the switch's secure and reliable installation. Additionally, you can use two bolts, each less than 4.8mm in height and 4mm in diameter, inserted into the holes at the bottom of the switch for a more secure four-point installation.

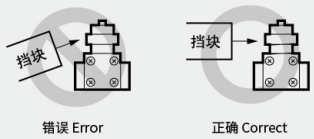


接点排列 Contact arrangement

接点排列如下图所示。
The arrangement of contacts is shown in the following figure.



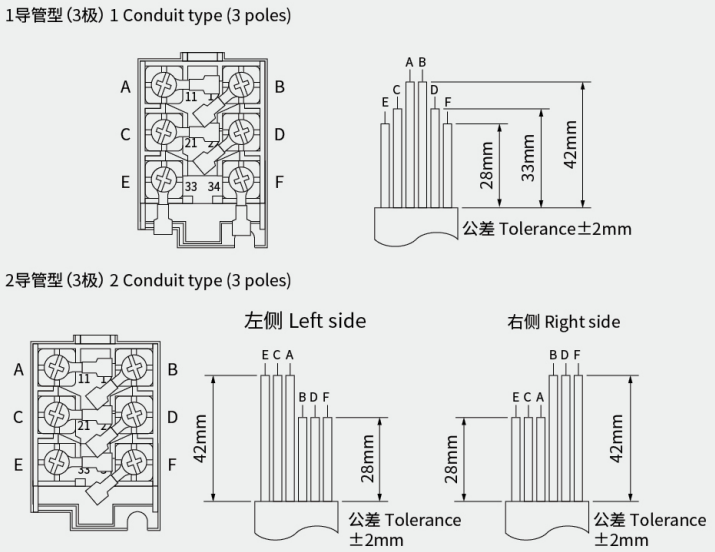
确保挡块以正确角度接触传动杆。
如果斜向地向开关的传动杆(滚珠)施加负载，会导致传动杆及运转轴的变形、折损。
Ensure that the stop contacts the transmission rod at the correct angle.
If a load is applied diagonally to the transmission rod (ball) of the switch, it will cause deformation and damage to the transmission rod and operating shaft.

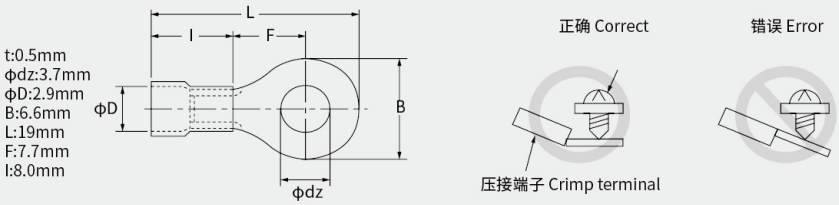


接线 Wire

请在断电状态下进行开关接线操作，通电状态下接线可能会造成触电危险。
接线时务必注意，不要让导线的细小碎片或其他微粒进入开关内部。
使用绝缘管和 M3.5 压接端子连接时，按照图示正确放置压接端子，避免压迫到外壳或外盖。适用的导线尺寸为 AWG20 至 AWG18 或 0.5 至 0.75mm2。
选用适当长度的导线以确保外盖平整关闭且牢固。切勿将压接端子塞进外壳缝隙，这可能导致外壳损坏或变形。
为防止端子与开关外壳内部接触，使用厚度不超过 0.5mm 的端子。

Always wire the switch with the power off to avoid the risk of electric shock.
Ensure no small wire fragments or particles enter the switch during wiring.
When connecting with an insulated tube and M3.5 crimp terminals, position the terminals as shown in the diagram to avoid pressing against the casing or cover. The suitable wire size is AWG20 to AWG18 or 0.5 to 0.75mm2.
Use wires of appropriate length to ensure the cover closes smoothly and securely. Do not stuff the crimp terminals into gaps in the casing, as this may cause damage or deformation.
To prevent contact between the terminals and the interior of the switch housing, use terminals with a thickness of no more than 0.5mm.





导管接口 Conduit Interface

请使用建议的连接器和适当的扭矩进行安装。使用过大的扭矩可能会导致外壳损坏。同时，请确保使用与连接器相匹配外径的电缆。
在接线过程中，对于未使用的导管口，请装上并紧固导管盖。确保按照推荐的扭矩值紧固导管盖。本开关配备有导管盖（适用于双导管型）。

Please install using the recommended connectors and appropriate torque to avoid damaging the casing due to excessive torque. Also, ensure that the cable used matches the outer diameter requirements of the connector.
During wiring, for any unused conduit openings, fit and tighten the conduit caps. The caps should be tightened to the specified torque. This switch is equipped with conduit caps, suitable for models with two conduit interfaces.

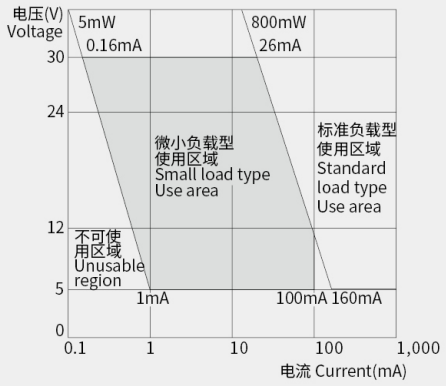
调整摆杆位置 Adjusting Swing Rod Position

通过在摆杆上安装螺钉，摆杆的位置可以在 360°范围内以 7.5°为单位进行精确设定。摆杆和旋转轴上的凹槽设计可以有效地防止摆杆从旋转轴上滑落。此外，通过松开螺钉，还可以调整可调式滚珠摆杆型的摆杆长度。
在将摆杆进行正反向（正 / 反）安装时，应先卸下摆杆正面的螺钉，这样可以确保在操作过程中摆杆的活动范围不会超过水平 180°。

微小负载型的使用 Applications Under Minimal Load

开关接点可用于一般负载或微小负载。但是，已经连接过一般负载的接点，就不能用于连接更小容量的负载。否则，可能导致接触面的糙化，而且可能失去接触可靠性。
如果在开关微小负载电路时使用一般负载用开关，可能会引起接触不良。下图为开关负载区域范围定义。本目录册内产品适用于 DC24V 10mA 以上范围，当使用负载小于 DC24V 10mA 以下时，可能存在由于电流过小无法击破触点表面氧化膜或硫化膜的现象，从而导致开关接触不良。所以当使用负载小于 DC24V 10mA 以下时，请咨询昌得电气科技有限公司进行产品定制。
请设置 CR 电路等吸收电路，防止震荡和抖动所导致的噪声和脉冲缺失，对于开关时会产生冲击电流的负载，请插入接点保护电路，以免导致耐久性降低。

Contacts used for standard loads must not subsequently be used for smaller loads, because surface wear can reduce contact reliability. Standard contacts are suitable for 24VDC, 10mA or above. At lower loads, the current may not break through oxidized films on the contact surface, causing unreliable contact.
Select a contact specification suitable for the intended load before installation.
Use an appropriate CR suppression circuit to limit electrical noise and transient pulses. For loads that produce surge current at the switch, provide contact protection to avoid reducing electrical endurance.



使用注意事项 Using Precautions

本公司产品是作为工业产品而设计生产，严格遵守工业产品标准。我司明确声明，除非经过特殊设计并得到我司明确书面确认，我司产品不适用于以下应用场合：

- 要求极高可靠性的应用场合，包括核能、燃气、电力等要求长期稳定运行的系统。
- 要求极高安全性的应用场合，涉及人身安全与财产的情况。
- 苛刻条件、严酷环境的应用场合，包括室外、存在化学污染、电磁、振动或冲击影响的环境。
- 有火灾或爆炸风险的应用场合，包括存在易燃爆性气体、强酸强碱化学品等物质的环境。
- 涉及军工用途、航天航空项目的应用场合。

The company’s products are designed and produced as industrial products, in strict compliance with industrial product standards. We expressly declare that, unless specifically designed and expressly confirmed by us in writing, our products are not intended for the following applications:

- Applications that require high reliability, including nuclear, gas, electric and other systems that require long-term stable operation.
- Applications requiring very high security, situations involving personal safety and property.
- Applications in harsh conditions, harsh environments, including outdoor, chemical contamination, electromagnetic, vibration or shock effects.
- Applications where there is a risk of fire or explosion, including environments where flammable and explosive gases, strong acids and alkali chemicals are present.
- Applications involving military use and aerospace projects.